**CURRICULUM VITAE**
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**EDUCATION**
1971 **MS in Physics**, Moscow State University, Moscow, Russia
*Major:* Theoretical and Mathematical Physics. *Minors:* Computational Physics, Applied Mathematics, and Numerical Methods.
1978 **PhD in Physics**, Moscow State University, Moscow, Russia

**BRIEF EMPLOYMENT HISTORY**
*2003 – present,* **Adjunct Professor,** *Earth System Science Interdisciplinary Center,* **University of Maryland**
*1998 - present*, **Leader,** *Marine Prediction Group,* **SAIC at NCEP/NWS/NOAA**.
*1990-1998*, **Physical Scientist,** **SAIC at NCEP/NWS/NOAA**
*1989-1990*, **Research Scientist** at **The George Washington University** (Department of Electrical Engineering & Computer Science).
*1973-1989*, **Senior Research Scientist** at **Institute of Nuclear Physics, Moscow State University**, Moscow, Russia.

**RESEARCH AWARD**S
        ***"Best of Conference" Award***, 1999 International Joint Conference on Neural Networks, Washington D.C., 1999
        ***The NMC (NOAA) Outstanding Performance Award***: *for innovative research on the application of neural networks to satellite image processing*, NOAA, 1994.

**SPECIAL EXPERIENCE**S
        ***Member*** of the IEEE/CIS Working Group "Computational intelligence in earth and environmental sciences", since 2005
        ***Member*** of the INNS Working Group "Computational intelligence in earth and environmental sciences", since 2005
        ***Member*** of the *Committee on Artificial Intelligence Applications to Environmental Science* of American Metrological Society since 1999, ***Chair*** of this Committee from 2000 to 2003
        ***Organizer*** of a special session on "Computational Intelligence in Earth and Environmental Sciences" at 2006 IEEE/INNS International Joint Conference on Neural Networks, Vancouver, Canada
        ***Organizer*** of a special session on "Applications of Adaptive Learning Methods in Earth Sciences and Climate Models" at 2005 IEEE/INNS International Joint Conference on Neural Networks, Montreal, Canada.
        ***Organizer*** and ***Chair*** of the *3rd Conference on Artificial Intelligence Applications to the Environmental Science*, Feb 9-13, 2003, Long Beach, CA

***Member*** of the organization committee of the International Workshop on "Advanced Environmental Sensing and Monitoring Technologies"

***Member*** of the program committee and ***organizer*** of a special session at 2003, 2004, and 2005 IEEE International Conference on Computational Intelligence for Measurement Systems and Applications.

**Short Course Invited by AMS:** "Neural Network Applications to Environmental Sciences"    2 days Short Course, 84 Annual Meeting of American Meteorological Society, Seattle, WA, January 12-13 January 2004

**Short Course Invited by AMS:** "Neural Network Applications to Environmental Sciences"    2 days Short Course, 82 Annual Meeting of American Meteorological Society, Orlando, FL, January 12-13 January 2002

***Invited Talk:****"NNs in satellite remote sensing, satellite meteorology and oceanography",* The First International Workshop on Advanced Environmental Sensing and Monitoring Technologies, Milan, Italy, June 26-28, 2001

***Invited Talk:****"Using NNs to improve computational efficiency of environmental numerical models",* The First International Workshop on Advanced Environmental Sensing and Monitoring Technologies, Milan, Italy, June 26-28, 2001

***Invited Talk:****"Neural Networks in Environmental Modeling"* , Information Technology Seminars: "Focus on the Future", National Institute of Standards and Technology, Washington DC, September, 2000

***Invited Talk:****"Introduction to Artificial Neural Networks with Atmospheric and Oceanic Applications*", 80th AMS Annual Meeting, Long Beach, California,10-14 January 2000

***Special Invited Lecture:*** "*Neural network solutions for remote sensing problems*" at 7th International Meeting on Statistical Climatology, Whistler, Canada, May 25_29, 1998

## CURRENT RESEARCH INTERESTS/ACTIVITIES
- Neural network emulations of atmospheric and ocean model physics
- Assimilation of satellite data into numerical models
- Neural network applications to satellite meteorology, satellite image analysis, statistical data analysis and data mining
- Inverse and forward problems in space-borne remote sensing

## RECENT NEW RESULTS
- Methodology of hybridization of components based on first principles and machine learning components in computationally efficient hybrid numerical model
- Neural network emulation approach for atmospheric physics parameterizations
- Neural network method for fast physical parameterizations in oceanic and wave models
- Neural network approach to develop satellite multi-parameter retrieval algorithms
- Neural network approach to develop fast forward models for direct assimilation of satellite data

**SELECTED REFEREED PUBLICATIONS** (the total of one book, two book chapters, over 70 papers in refereed scientific journals, and over 100 technical and conference papers)**:**

*Book nad Book Chapters:*
**Kukulin, V.I., V.M. Krasnopolsky, and J. Horacek,** *"Theory of resonances. Principles and applications."* Kluwer Academic Publisher, Dordrecht/Boston/London, 1989
**V. Krasnopolsky,** 2007, "Neural Network Applications to Solving Forward and Inverse Problems in Atmospheric and Oceanic Satellite Remote Sensing" in "*Artificial Intelligence in Environmental Sciences*", Springer, in press
**V. Krasnopolsky,** 2007, "Neural Network Applications to Developing Hybrid Atmospheric and Oceanic Numerical Models " in "*Artificial Intelligence in Environmental Sciences*", Springer, in press

*Papers:*
**V.M. Krasnopolsky,** 2006, "Neural Network Emulations for Complex Multidimensional Geophysical Mappings:  Applications of Neural Network Techniques to Atmospheric and Oceanic Satellite Retrievals and Numerical Modeling", *Reviews of Geophysics*, submitted
**V.M. Krasnopolsky and M.S. Fox-Rabinovitz,** 2006: "Cmplex Hybrid Models Combining Deterministic and Machine Learning Components for Numerical Climate Modeling and Weather Prediction", *Neural Networks,* 19, 122-134
**V. Cherkassky, V. Krasnopolsky, D.P. Solomatine, and J. Valdes, 2006:** "Computational intelligence in earth sciences and environmental applications: Issues and challenges" , *Neural Networks*, 19, 113-121
**V.M. Krasnopolsky and M.S. Fox-Rabinovitz,** 2006: "A New Synergetic Paradigm in Environmental Numerical Modeling: Hybrid Models Combining Deterministic and Machine Learning Components", *Ecological Modelling*, 191, 5-18
**V.M. Krasnopolsky, M.S. Fox-Rabinovitz, and D.V. Chalikov,** 2005: "New Approach to Calculation of Atmospheric Model Physics: Accurate and Fast Neural Network Emulation of Long Wave Radiation in a Climate Model", *Monthly Weather Review*, v. 133, No. 5, 1370-1383
**H. Tolman, V. M. Krasnopolsky, and D. Chalikov,** 2005: "Neural Network Approximations for Nonlinear Interactions in Wind Wave Spectra: Direct Mapping for Wind Seas in Deep Water", *Ocean Modelling*, v. 8, issue 3, 253-278
**Krasnopolsky, V.M. and H. Schiller**, 2003: "Some Neural Network Applications in Environmental Sciences. Part I: Forward and Inverse Problems in Geophysical Remote Measurements", *Neural Networks,* v. 16, pp. 321-334
**Krasnopolsky, V. M.  and F.  Chevallier**, 2003: "Some Neural Network Applications in Environmental Sciences. Part II: Advancing Computational Efficiency of Environmental Numerical Models",  *Neural Networks*, v. 16, pp. 335-348
**Krasnopolsky, V. M. , D. V. Chalikov, and H. L. Tolman,** 2002: "A Neural Network Technique to Improve Computational Efficiency of Numerical Oceanic Models", *Ocean Modelling*, v. 4, 363-383
**Li, X., W. Pichel, P. Clemente-Colon, V. Krasnopolsky, and J. Sapper**, 2001: "Validation of Coastal Sea and Lake Surface Temperature Measurements Derived from NOAA/AVHRR Data", *Int. J. Remote Sensing*, v. 22. 1285-1303

**Krasnopolsky, V.M., W.H. Gemmill, and L.C. Breaker,** 2000: "A neural network multi-parameter algorithm for SSM/I ocean retrievals: comparisons and validations", *Remote Sensing of Environment*, Vol. 73, pp. 133-142

**Breaker L. C. , V. M. Krasnopolsky, and E. M. Maturi,** 2000, "GOES-8 imagery as a new source of data to conduct ocean feature tracking",*Remote Sensing of Environment*, Vol. 73, pp. 198-206

**Krasnopolsky, V.M., W.H. Gemmill, and L.C. Breaker,** 1999: "A Multi-parameter Empirical Ocean Algorithm for SSM/I Retrievals", *Canadian J. Remote Sensing*, Vol. 25, No. 5, pp. 486-503

**Gemmill, W.H. and V.M. Krasnopolsky,** 1999: "The use of SSM/I data in operational marine analysis", *Weather and Forecasting,* Vol. 14, No.5, pp. 789-800

**Chalikov, D., L. C. Breaker, V. Krasnopolsky, and D. Rao,** 1998: "Revisiting the Question of Assimilating Temperature alone into a Full Equation of State Ocean Model", *Ocean Modeling*, Issue 116, p. 13-14

**Breaker, L.C., W.H. Gemmill, and V.M. Krasnopolsky,** 1995: "Surface Wind Speeds over the Ocean Inferred from Brightness Temperatures Acquired from the Special Sensor Microwave Imager (SSM/I)" , *Backscatter*, v. 6, No. 3, pp. 8,15

**Krasnopolsky, V.M., L.C. Breaker, and W.H. Gemmill,** 1995: "A Neural Network as a Nonlinear Transfer Function Model for Retrieving Surface Wind Speeds from the Special Sensor Microwave Imager.", *J. Geophys. Res*, v. 100, No. C6, pp. 11,033-11,045

**Breaker, L.C. , V.M. Krasnopolsky, D.B. Rao, and X.-H. Yan,** 1994: "The Feasibility of Estimating Ocean Surface Currents on an Operational Basis Using Satellite Feature Tracking.", *Bull. of AMS,* v. 75, No. 11, pp.2085-2095

**Krasnopolsky, V. M., and L.C. Breaker,** 1994: "The Problem of Navigation of AVHRR Images Revisited.", *Int. J. Remote Sensing*, v.15, No.5, 979-1008

**Krasnopolsky, V.M., V.I. Kukulin, E. Kusnetzova, J. Horacek and N.M. Queen,** 1991: "Energy-dependent phase-shift analysis of $^2$H+$^4$He scattering in the energy range $0.87 < E_d < 5.24$ MeV." *Phys.Rev.* v. C2, pp. 822-834

**V. Voronchev, V. Krasnopolsky, V. Kukulin, Y. Nakao, and K. Kudo.**"Nuclear-physical aspects of controlled thermonuclear fusion. Dynamic multicluster model of light nuclei and its application for studying thermonuclear reactions." *Memoirs of the Faculty of Engineering, Kyushu University*, v. 51 (1991) 63-80

**Krasnopolsky, V.M., V.I. Kukulin, and J. Horacek,**"Pade approximant technology for treating scattering data. I. Theory, models, and parametrization of scattering data." *Czech. J. Phys.,* v. B39, pp. 593-613,1989

**Krasnopolsky, V.M., V.I. Kukulin, and V.T. Voronchev,** "On the ignition of the thermonuclear process in DD plasma by injecting T$^6$Li pellets." *Nuclear Fusion* v. 28, pp. 2135-40, 1988

**Krasnopolsky, V.M., V.I. Kukulin, and V.T. Voronchev,** "The feasibility of measuring of nuclear cross sections in subbarier region from pressure of laser targets." *Laser and Particle Beams*, v. 5, pp. 898-901,1987.

**Bok J., J. Horacek, V. Krasnopolsky, and V. Kukulin,** "Determination of the deuteron asymptotic D- to S-state ratio by a Pade approximant technique.", *Phys. Lett.,* v. 172B, pp. 1-4,1986

**Kukulin V., V. Krasnopolsky, P. Sazonov, and V. Voronchev,** "Detailed study of the cluster structure of light nuclei in a three-body model. II. The spectrum of low-lying

states of nuclei with A=6.", *Nucl. Phys.*, v. A453, pp. 365-88, 1986

**Krasnopolsky, V.M., V. Kukulin, V. Pomerantzev, and P. Sazonov,** "Deuteron structure and NN-phase shifts for realistic local super deep NN-potential with extra state", *Phys. Lett.*, v. 165B, pp. 7-12, 1985

**Krasnopolsky V.M., V.I. Kukulin, and J.Horacek,** "Construction of S-matrix from scattering data", *Czech. J. Phys.*, v. 35B, pp. 805-19,1985

**Krasnopolsky, V.M., V.I. Kukulin, and V.T. Voronchev,** "Study of the kinetics of the nuclear processes in the hot DD and D$^6$Li plasmas.", *Nuclear Fusion,* v. 24, pp.1117-28, 1984

**Krasnopolsky, V., V. Kukulin, and V. Voronchev,** "On the extrapolation of the low-energy cross-section of the nuclear reactions in the d + $^6$Li system.", *J. Phys. G: Nucl. Phys.*, v. 10, pp. L213-9, 1984

**Kukulin, V., V. Krasnopolsky, P. Sazonov, and V. Voronchev,** "Detailed study of the cluster structure of light nuclei in a three-body model. I. Ground state of $^6$Li." *Nucl. Phys.*, v. A417, pp. 128-56, 1984

**Kukulin, V., V. Krasnopolsky, V. Pomerantzev, and P. Sazonov,** "The NN-potential with forbidden state suggested from a six-quark model with one-pion exchange.", *Phys. Lett.*, v. 135B, pp. 20-5, 1984

**Kukulin, V., V. Krasnopolsky, P. Sazonov, and V. Voronchev,** "The ground- and excited-state wave functions of A=6 nuclei in terms of three body model.", *Phys. Lett.*, v. 121B, pp. 96-100, 1983

**Krasnopolsky, V., V. Kukulin, and V. Voronchev,** "A variational study of the ground and excited states of light nuclei in a three-body model on the complete basis. I. General formalism. *J. Phys. G: Nucl. Phys.*, v. 8, pp. 667-78,1982

**Krasnopolsky, V., V. Kukulin, and P. Sazonov,** "A variational study of the ground and excited states of light nuclei in a three-body model on the complete basis. II. The structure of $^6$He-$^6$Li-$^6$Be nuclei in $^4$He + 2N model". *J. Phys. G: Nucl. Phys.*, v. 8, pp. 679-88,1982

**Krasnopolsky, V., and V. Kukulin,** "The Pade approximant method for finding the Hilbert-Shmidt eigenvalues and eigenfunctions in the two- and three-body problem.", *Phys. Lett.*, v. 83A, pp. 98-102, 1981

**Krasnopolsky, V., and V. Kukulin,** "A new method to describe the stripping to unbound state and other reactions with unstable particles.", *Phys. Lett.*, v. 96B, pp. 4-6, 1980

**Krasnopolsky, V., and V. Kukulin,** "Theory of resonant state based on analytic continuation in the coupling constant.", *Phys. Lett.*, 69A, pp. 251-4,1978

**Krasnopolsky, V., and V. Kukulin,** "A stochastic variational method for the few-body systems.", *J. Phys. G: Nucl. Phys.*, v. 3, pp. 795-807,1977

Revised on June 1, 2006